CLAIMS

I claim:

1. A shaped contoured structural member, comprising:

at least one contoured inner layer comprising a composite material or a metal-containing material;

at least one contoured outer layer comprising a composite material or a metal-containing material; and

at least one intermediate layer having a ribbed structure connecting the at least one inner layer and the art least one outer layer.

2. The structural member of claim 1, wherein the structural member has a substantially non-straight configuration.

3. The structural member of claim 1, wherein the metal-containing material is a light metal or alloy thereof.

4. The structural member of claim 1, wherein the metal-containing material is a heavy metal or alloy thereof.

5. The structural member of claim 2, wherein the substantially non-straight configuration is a bent configuration.

6. The structural member of claim 1, further comprising at least one initiator.

7. A substantially non-straight structural member, comprising:

at least one contoured inner layer comprising a composite material or a metal-containing material;

at least one contoured outer layer comprising a composite material or a metal-containing material; and

at least one intermediate layer having a ribbed structure connecting the at least one inner layer and the art least one outer layer.

8. The structural member of claim 7, wherein the metal-containing material is a light metal or alloy thereof.

9. The structural member of claim 7, wherein the metal-containing material is a heavy metal or alloy thereof.

10. The structural member of claim 7, wherein the substantially non-straight structural member has a bent configuration.

11. The structural member of claim 7, further comprising at least one initiator.

12. The structural member of claim 1, wherein the composite material is a reinforced resin matrix material.

13. The structural member of claim 7, wherein the composite material is a reinforced resin matrix material.

14. The structural member of claim 1 or 7, wherein both the at least one inner layer and the at least one outer layer comprise a composite material.

15. The structural member of claim 1 or 7, wherein both the at least one inner layer and the at least one outer layer comprise a metal-containing material.

16. The structural member of claim 1 or 7, wherein the at least one inner layer comprises a composite material and the at least one outer layer comprises a metal-containing

material.

17. The structural member of claim 1 or 7, wherein the at least one inner layer comprises a metal-containing material and the at least one outer layer comprises a composite material.

18. A bent structural member, comprising:

at least one contoured inner layer comprising a composite material or a metal-containing material;

at least one contoured outer layer comprising a composite material or a metal-containing material; and

at least one intermediate layer having a honeycomb structure connecting the at least one inner layer and the art least one outer layer.

19. The structural member of claim 18, further comprising at least one initiator.

20. The structural member of claim 18, further comprising at least one structural component.

21. A method for making a shaped, contoured structural member, comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a shaped mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material; and

connecting the at least one inner and outer layer to the at least one intermediate layer.

22. The method of claim 21, including providing the at least one inner layer by roll wrapping the at least one inner layer over a substrate.

23. The method of claim 22, including providing the at least one outer layer by roll wrapping the at least one outer layer over the at least one intermediate layer.

24. The method of claim 23, further including removing the substrate.

25. The method of claim 24, including partially or completely filling the interior created by removing the substrate.

26. The method of claim 25, further including constraining the at least one outer layer when connecting the at least one inner and at least one outer layer to the at least one intermediate layer prior to removing the substrate.

27. The method of claim 26, including constraining the at least one outer layer by roll wrapping at least one layer of a shrink-wrap material over the at least one outer layer.

28. The method of claim 27, including removing the at least one layer of the shrink-wrap material after the reaction.

29. The method of claim 27, further including providing at least one pressure distributor over the at least one outer layer.

30. The method of claim 29, including providing a plurality of layers of shrink-wrap material with the at least one pressure distributor between two of said layers.

31. A method for making a shaped, contoured structural member, comprising:

providing at least one inner layer comprising a composite material or a metal-containing

material over a substantially-straight mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material;

removing the mandrel;

modifying the shape of the at least one inner layer, at least one intermediate layer, and the at least one outer layer to a substantially non-straight shape; and

connecting the at least one inner and outer layer to the at least one intermediate layer.

32. The method of claim 31, including modifying the shape by using an exterior mold and using an internal pressure.

33. The method of claim 31, including modifying the shape and connecting the at least one inner and outer layer to the at least one intermediate layer at substantially the same time.

34. A method for making a shaped, contoured structural member, comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a shaped mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material;

constraining the outer portion with a shrink-wrap material;

connecting the at least one inner and outer layer to the at least one intermediate layer; and

removing the shrink-wrap material and the substrate.

35. A method for making a shaped, contoured structural member, comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a substantially-straight mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material;

removing the mandrel;

modifying the shape of the at least one inner layer, at least one intermediate layer, and the at least one outer layer to a substantially non-straight shape;

constraining the outer portion with a shrink-wrap material;

connecting the at least one inner and outer layer to the at least one intermediate layer; and

removing the shrink-wrap material and the substrate.

36. A shaped, contoured structural member made by the method comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a shaped mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material; and

connecting the at least one inner and outer layer to the at least one intermediate layer.

37. A shaped, contoured structural member made by the method comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a substantially-straight mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material;

removing the mandrel;

modifying the shape of the at least one inner layer, at least one intermediate layer, and the at least one outer layer to a substantially non-straight shape; and

connecting the at least one inner and outer layer to the at least one intermediate layer.

38. A shaped, contoured structural member made by the method comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a shaped mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material;

constraining the outer portion with a shrink-wrap material;

connecting the at least one inner and outer layer to the at least one intermediate layer; and

removing the shrink-wrap material and the substrate.

39. A shaped, contoured structural member made by the method comprising:

providing at least one inner layer comprising a composite material or a metal-containing material over a substantially-straight mandrel;

roll wrapping at least one intermediate layer over the at least one inner layer, the at least one intermediate layer having a ribbed structure;

providing at least one outer layer over the at least one intermediate layer, the at least one outer layer comprising a composite material or a metal-containing material;

removing the mandrel;

modifying the shape of the at least one inner layer, at least one intermediate layer, and the at least one outer layer to a substantially non-straight shape;

constraining the outer portion with a shrink-wrap material;

connecting the at least one inner and outer layer to the at least one intermediate layer; and

removing the shrink-wrap material and the substrate.